UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/645,125 | 08/21/2003 | Daniel C. Birkestrand | ROC920030189US1 | 7107 |

46797          7590          12/09/2009
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| EXAMINER |
|---|
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| ART UNIT | PAPER NUMBER |
|---|---|
| 2195 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 12/09/2009 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| | Application No. | Applicant(s) |
| | 10/645,125 | BIRKESTRAND ET AL. |
| **Office Action Summary** | Examiner | Art Unit |
| | MENGYAO ZHE | 2195 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)☒ Responsive to communication(s) filed on <u>24 September 2009</u>.

2a)☒ This action is **FINAL**.       2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)☒ Claim(s) <u>1,2,4-13 and 30-38</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,2,4-13 and 30-38</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

## Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>9/8/2009</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

## DETAILED ACTION

1.      Claims 1-2, 4-13, 30-38 are presented for examination.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1.      Claims 1-2, 4-6, 8, 9, 30, 36, 38 are rejected under 35 U.S.C. 103(a) as being

unpatentable over A case for Grid Computing On Virtual Machines, Fortes et al

(hereafter Fortes) in view of Camble et al., Pub No. 2003/0135580 (hereafter Camble).

2.      Fortes and Camble were cited in the previous office action.

3.      As per claims 1, 30, 36, Fortes teaches a method for expanding resource

available to a first logical partition on a single computer associated with a client (Section

1. Introduction, Paragraph 4 that starts with "virtual machines present the image of a

dedicated raw machine to each user..."; Section 4, step 1: note that the VM is

instantiated on a single physical machine), the method comprising:

Associating one or more partition resources of the first logical partition with a

grid, wherein the grid comprises grid resources that are available for use by a plurality

of logical partitions associated with the grid (Section 2.2 Advantages, Security and

Isolation, Resource Control; Section 3.2, subsection Application Perspective; Section

3.4: each VM is a logical partition and the provider has control over how much resource

of the VM is available to the user based on its scheduling constraints; logical users

correspond to a plurality of logical partitions associated with the grid);

Providing grid resources from the grid to the first logical partition based upon

usage of the partition resource of the first logical partition (Section 2.2, Resource

Control, 1$^{st}$ Para; Section 4, 2$^{nd}$ Para; Section 3.1, 2$^{nd}$ Para).

Fortes does not specifically teach providing on-demand resources to the first

logical partition based upon the usage of the partition resources of the first logical

partition and a usage of the grid resources, wherein the on-demand resources are

available to the system, and access to the on demand resources is controlled by a

manufacturer of the system.

However, Camble teaches providing on-demand resources to logical partitions

based upon the usage of the partition resources, wherein the on-demand resources are

available to the system, and access to the on demand resources is controlled by a

manufacturer of the system (Para 26) for the purpose of purchasing additional

resources.

It would have been obvious to one having ordinary skill in the art at the time of

the applicant's invention to modify the teachings of Fortes with providing on-demand

resources to logical partitions based upon the usage of the partition resources, wherein

the on-demand resources are available to the system, and access to the on-demand

resources is controlled by a manufacturer of the system, as taught by Camble, because

it allows for the purchase of additional resources.

4.      As per claim 2, Camble teaches comprising metering a usage of the on-demand

resources by the client to determine a cost to assess the client (Para 26). Fortes

teaches using grid resources among logical partitions (Section 2.2 Advantages, Security

and Isolation, Resource Control; Section 3.2, subsection Application Perspective;

Section 3.4).

5.      As per claims 4, Fortes teaches wherein associating the one or more partition

resources of the first logical partition comprises enabling allocation from the grid

resources to the logical partition (Section 2.2, Resource Control, 1st Para; Section 4, 2nd

Para; Section 3.1, 2nd Para).

6.      As per claim 5, Fortes teaches wherein associating the one or more partition

resources of the first logical partition comprises registering with the grid at least a

portion of partition resources associated with the first logical partition, to allow the

portion to be allocated to the plurality of logical partitions associated with the grid

(Section 3.4; Section 4, 2nd Para).

7.       As per claim 6, Fortes does not specifically teach wherein providing grid

resources comprises: determining an unallocated portion of grid resources and

allocating the unallocated portion of the grid resources to the first logical partition.

However, Fortest does teach providing grid resources to logical partitions. And

since it would have been obvious to one having ordinary skill in the art of grid computing

that the purpose of the grid is to allocate free/unallocated grid resources to needed

receivers to run tasks, it would have been obvious to one having ordinary skill in the art

at the time of the applicant's invention to have the Fortes' logical partition be the

receiver that receives unallocated portion of grid resources in order to run the

applications that its client requests.


8.       As per claim 8, Camble teaches wherein providing on-demand resources

comprises: determining that use of partition resources of the first partition has at least

reached a partition utilization threshold; determining that sufficient resources are

unavailable from the grid resources; and allocating an unallocated portion of the on-

demand resources to the logical partition (Para 26: the amount of resources allowed by

the license key corresponds to the threshold, which if it is exceeded, the on-demand

resources are allocated to the logical partition).


9.       As per claims 9, Camble teaches wherein providing on-demand resources further

comprises: determining that usage of the grid resources has at least reached a grid

utilization threshold; requesting an enablement code to enable the on-demand

resources; and allocating an unallocated portion of the on-demand resources to the

logical partition (Para 26).


10.     Claims 7, 10, 11-13, 31-35, 37 are rejected under 35 U.S.C. 103(a) as being

unpatentable over A case for Grid Computing On Virtual Machines, Fortes et al

(hereafter Fortes) in view of Camble et al., Pub No. 2003/0135580 (hereafter Camble)

further in view of Lumelsky et al., Patent No. 6,460,082 (hereafter Lumelsky).

11.     Lumelsky was cited in the previous office action.


12.     As per claims 7, 10, 31, Camble teaches a method for expanding resources

available to logical partitions on a single computer associated with a client, the method

comprising:

        allocating on-demand resources to the first logical partition after the first logical

partition reaches a utilization threshold for the previously allocated resources, wherein

the on-demand resources are available to the single computer, and access to the on

demand resources is controlled by a manufacturer of the single computer (Para 26: the

amount of resources allowed by the license key corresponds to the threshold, which if it

is exceeded, the on-demand resources are allocated to the logical partition);

        billing the client for usage of the on-demand resources (Para 26).

        Camble does not teach registering resources with a grid as grid resources,

wherein the grid resources are available for use by a plurality of logical partitions and

allocating grid resources to a first logical partition after utilization of partition resources of the first logical partition reaches a first utilization thresholds.

Fortes teaches registering resources with a grid as grid resources, wherein the grid resources are available for use by a plurality of logical partitions for the purpose of sharing resources across virtual clusters (Section 2.2 Advantages, Security and Isolation, Resource Control; Section 3.2, subsection Application Perspective; Section 3.4: each VM is a logical partition and the provider has control over how much resource of the VM is available to the user based on its scheduling constraints; logical users correspond to a plurality of logical partitions associated with the grid).

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Camble with a grid as grid resources, wherein the grid resources are available for use by a plurality of logical partitions, as taught by Fortes, because it allows sharing resources across virtual clusters.

Fortes does not specifically teach a first utilization threshold where allocating grid resources to a first logical partition after utilization of partition resources of the first logical partition reaches a first utilization thresholds.

However, Lumelsky teaches allocating grid resources to the logical partition after utilization of partition resources by the logical partition reaches a first utilization threshold (Column 12, lines 38-45; Column 14, lines 35-43, 58-67) for the purpose of establish an overflow pool incase more resources are needed to provide run-time resource compensation.

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to combine the teachings of Camble in view of Fortes with allocating grid resources to the logical partition after utilization of partition resources by the logical partition reaches a first utilization threshold, as taught by Lumelsky, because it allows the establishment of an overflow pool incase more resources are needed to provide run-time resource compensation.

13.     As per claim 11, Camble in view of Fortes further in view of Lumelsky does not teaches billing the client for usage of the grid resources to offset a cost associated with enabling the on-demand resources. However, since Camble teaches billing for on-demand resources, it would have been obvious for one having ordinary skill in the art at the time of the applicant's invention to bill the client for any type of resources, including grid resources.

14.     As per claim 12, Camble teaches the method of claim 10, wherein billing the client for usage of the on-demand resources comprises billing the client for the on-demand resources allocated to the first logical partition based upon actual usage of the on-demand resources (Column 26).

15.     As per claim 13, Lumelsky teaches the method of claim 10, wherein billing the client for usage of the resources comprises billing the client for the resources allocated to the first logical partition based upon a quantity of the resources allocated and the

amount of time for which the quantity of the on-demand resources are allocated. *(Figure 2, unit 152: it has a cost per minute associated with it.)*. Camble teaches on-demand resources may be allocated to the logical partitions (Para 26).

16.     As per claim 32, Camble teaches wherein providing on-demand resources comprises: determining that use of partition resources of the first partition has at least reached a partition utilization threshold; determining that sufficient resources are unavailable from the grid resources; and allocating an unallocated portion of the on-demand resources to the logical partition (Para 26: the amount of resources allowed by the license key corresponds to the threshold, which if it is exceeded, the on-demand resources are allocated to the logical partition).

17.     As per claim 33, Lumelsky further teaches the threshold comprising an amount of resources used during a predetermined amount of time. *(Column 8, lines 39-60: resource usage is fixed to a number of time intervals allowed for usage.)*

*18.*     As per claims 34, 37, Camble teaches a first fee and a second fee. *(Para 19, lines 11-12; Para 21, lines 1-6).*

19.     As per claim 35, Camble in view of Fortes further in view of Lumelsky does not specifically teach wherein at least one of the first fee and the second fee vary based on a factor chosen from the group consisting of a time of day and a time of year. However,

it would have been obvious to one having ordinary skill in the art of computing resource
provisioning to vary to the fee according to demands and needs for the purpose of
maximizing profits over time.


### Response to Arguments

20.     Applicant's arguments filed on 9/24/2009 have been fully considered but are not
persuasive.

In the remark, the applicant argued that:

> i)      Fortes does not teach providing grid resources from the grid to the first
> logical partition based upon usage of the partition resources of the first logical
> partition. Fortes only teaches assigned resources given to the VM/logical partition
> at its startup. However, the applicant claims that additional resources may be
> given to the VM/logical partitions as needed while it is running.

The Examiner respectfully disagrees with the applicant. As to point:

> i)      First, the Examiner whishes to note that part of the definition and the
> purpose of grid computing is that entities may donate and receive resources from
> one another dynamically, which means the resources are given to an entity or
> donated to another not just at startup, but also during the runtime as well.  The
> entities are usually computing components such as a physical computer. Fortes
> essentially teaches a grid computing environment with virtual machines (the VM
> corresponds to logical partitions) in it, that may provide resources and use

resources during run time. Basically, Fortes went a step further, teaching that the entities sharing the resources are VMs. Therefore, it seems that when the applicant argues that Fortes does not teach that resources are given to the virtual machine during its run time aside from those given at instantiation, the applicant has missed the entire point of what grid computing is all about.

However, just to further prove this, the following elements specifically taught by Fortes prove that VM also receives resources during its runtime as needed. First, Fortes teaches grid computing with VMs, with the following definition given: the ability to share resources is a basic requirement for the deployment of grids (Section 2.2, 1st sentence of 2nd Para). Furthermore, under section 2.2, subsection titled Resource control, Fortes further teaches that not only resources used by a VM can be customized at instantiation time, but it is also possible to govern the amount of resources used by a VM "at run-time". Section 3, 1st Para further notes that "VM are instantiated and managed DYNAMICALLY". In Section 3.2, 2nd Para, Fortes further teaches that "the resource owner in turn sees a single entity to schedule onto his/her resources", where the single entity refers to the VM. This means that VM is capable of receiving resources from resource owner. Since grid computing is all about sharing resources dynamically, to which Fortes itself teaches that resources of VM can also be managed during runtime as shown above, this means that VM may receive resources from users during run time in addition to resources assigned statically to it during the VM's instantiation.

Fortes also teaches that the VM may migrate during its life time when necessary (Section 3.1, 1$^{st}$ Para), which means that the resources from the grid that are used to support the VM may be changed. In the instance where VM using resources A and B is changed to B and C, it results in the applicant's claimed element where the resources are provided from the grid to the first logical partition based upon usage of the partition resources of the first logical partition.

Lastly, subsection 6 under section 4 teaches that applications are part of the virtual machine or the logical partition. Then in section 3.2, subsection titled Application Perspective, Fortes teaches that the resources available to the applications are dynamic, meaning sometimes there may be more or less of resources available to the applications. Since the applications are part of the VM, it shows that the resources available to the applications and hence the VM are dynamic during run time, not just at the VM's instantiation.

## Conclusion

21.    **THIS ACTION IS MADE FINAL.**  Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action.  In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to MENGYAO ZHE whose telephone number is (571)272-

6946. The examiner can normally be reached on Monday Through Friday, 7:30 - 5:00

EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

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/Meng-Ai An/                                                          /MengYao Zhe/
Supervisory Patent Examiner, Art Unit 2195